CLAIMS

We Claim:

1. A method of trouble shooting a device in a digital electronic system, comprising:

transmitting an external event trigger signal to a scan module to began a scan operation in the device;

transmitting a synchronous scan command signal to a device core in the device;

holding values contained in the plurality of flip-flops in the device core unchanged when the synchronous scan command signal is received by the device core; and

transmitting the values contained in the plurality of flip-flops to external test equipment when the synchronous scan command signal is received.

2. The method recited in claim 1, wherein the transmitting an external event trigger signal to a scan module to began a scan operation in the device, further comprises:

connecting the external test equipment to the external event trigger signal and a scan chain signal, wherein the external event trigger signal and the scan chain signal are embedded in a baseboard in which the device is connected.

3.   The method recited in claim 2, wherein the transmitting the values contained in the plurality of flip-flops to external test equipment when the synchronous scan command signal is received, further comprises:

transmitting serially the values contained in the plurality of flip-flops to the external test equipment over the scan chain signal, wherein ordering the flip-flops is dependent upon the type of device being scanned.

4.   The method recited in claim 3, further comprises:

receiving and the values contained in the plurality of flip-flops serially by the external test equipment;

storing the values contained in the plurality of flip-flops; and

reporting to the user the values contained in the plurality of flip-flops by the external test equipment.

5.   The method recited in claim 4, wherein holding values contained in the plurality of flip-flops in the device core unchanged when the synchronous scan command signal is received by the device core, further comprises:

synchronizing the plurality of flip-flops in the device core using a scan clock signal generated by the external test equipment.

6.   The method recited in claim 5, further comprises:

controlling the transmission timing of the values contained by the plurality of flip-flops to the external test equipment based upon the scan clock signal.

7.   The method recited in claim 6, wherein the device comprises a processor, memory controller, USB interface, SCSI interface, or communications interface.

8.   A computer program embodied on a computer readable medium and executable by a computer for trouble shooting a device in a computer system, comprising:

transmitting an external event trigger signal to a scan module to began a scan operation in the device;

transmitting a synchronous scan command signal to a device core in the device;

holding values contained in the plurality of flip-flops in the device core unchanged when the synchronous scan command signal is received by the device core; and

transmitting the values contained in the plurality of flip-flops to external test equipment when the synchronous scan command signal is received.

9.   The computer program recited in claim 8, wherein the transmitting an external event trigger signal to a scan module to began a scan operation in the device, further comprises:

connecting the external test equipment to the external event trigger signal and a scan chain signal, wherein the external event trigger signal and the scan chain signal are embedded in a baseboard in which the device is connected.

10. The computer program recited in claim 9, wherein the transmitting the values contained in the plurality of flip-flops to external test equipment when the synchronous scan command signal is received, further comprises:

transmitting serially the values contained in the plurality of flip-flops to the external test equipment over the scan chain signal, wherein ordering the flip-flops is dependent upon the type of device being scanned.

11. The computer program recited in claim 10, further comprises:

receiving and the values contained in the plurality of flip-flops serially by the external test equipment;

storing the values contained in the plurality of flip-flops; and

reporting to the user the values contained in the plurality of flip-flops by the external test equipment.

12. The computer program recited in claim 11, wherein holding values contained in the plurality of flip-flops in the device core unchanged when the synchronous scan command signal is received by the device core, further comprises:

synchronizing the plurality of flip-flops in the device core using a scan clock signal generated by the external test equipment.

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13. The computer program recited in claim 12, further comprises:

controlling the transmission timing of the values contained by the plurality of

flip-flops to the external test equipment based upon the scan clock signal.

14. The computer program recited in claim 13, wherein the device

comprises a processor, memory controller, USB interface, SCSI interface, or

communications interface.

15. An apparatus to retrieve contents of a plurality of flip-flops contained

within a device in a digital electronic system, comprising:

an external test equipment to transmit an external event trigger signal and

receive the contents of the plurality of flip-flops;

a scan module embedded in the device and connected to the external test

equipment to receive the external event trigger signal and transmit the contents of

the plurality of flip-flops when the external event trigger signal is set on, wherein the

external event trigger signal is embedded in a baseboard in which the device is

attached to.

16. The apparatus recited in claim 15, further comprising:

a scan chain signal to connect the device to the external test equipment,

wherein the contents of the plurality of flip-flops is transmitted to the external test

equipment from the device over the scan chain signal in a serial manner.

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17.   The apparatus recited in claim 16, further comprising:

a scan clock signal generated by the external test equipment and connected

to the device to synchronize the transmission of the contents of the proud to flip-flops

over the scan chain signal.

18.   The apparatus recited in claim 17, wherein the scan module further

comprises

a synchronous scan command module to generate a synchronous scan

command signal to a device core contained within the device and having the plurality

of flip-flops contained in the device core, wherein when the synchronous scan

command signal is received the contents of the plurality of flip-flops is held constant.

19.   The apparatus recited in claim 18, wherein when the synchronous scan

command signal is received by the device core operations of the device are halted

20.   The apparatus recited in claim 19, wherein the external test equipment

will store and display the contents of the flip-flops upon receipt from the device.

21.   The apparatus recited in claim a 20, wherein the wherein the device

comprises a processor, memory controller, USB interface, SCSI interface, or

communications interface.